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RECENT LITERATURE.

SCUDDER'S BUTTERFLIES: THEIR STRUCTURE, CHANGES AND LIFE-HISTORIES.[1]—In this book we have a very successful attempt at a thorough study of the butterflies of a limited region, New England, not only from the point of view of the structure of the winged insects, but also of their transformations; and the author does not stop here, where many books on butterflies would naturally end, but in the light of modern biological science, he leads the student to observe their habits, their seasonal changes and histories, their styles of coloration, the sexual differences in coloring and structure, and the probable reasons for such diversity; then he speculates on the origin and development of ornamentation, on the ancestry of butterflies, and presents a genealogical table which also serves, as it naturally should, as a tabular view of the classification of butterflies in general, and finally he discusses the geographical distribution of butterflies, and in a few last words points out to the student how such a diversified region as New England received its butterfly population, especially how an Alpine summit, such as that of Mt. Washington, was peopled with its Arctic-like forms, the *Œneis semidea*.

In the preparation of these chapters, the author has evidently drawn very largely on knowledge acquired through his individual observations pursued for a number of years. So far from being in any sense a compilation, it is a fresh and original treatment of a most interesting theme, replete with many facts heretofore unpublished and unknown to the scientific public. The presentation of the subject is nearly always clear and simple, and the illustrations are, in many cases, original, and adds materially to the interest and value of the text. There is a good deal of inequality in the figures, the woodcuts, particularly those borrowed from the works of Harris and Riley, have been well printed; but by a false economy a number of figures prepared for photographic reproduction, however originally well prepared by the artist, do not print well, and we do not see how shaded drawings of this kind ever can be made to present a respectable appearance by the side of good woodcuts, though simple outline sketches print well enough.

Without farther enumerating the excellent features of the book, together with its good paper, neat typography and its general usefulness to the student, we will only say that it is a matter of congratulation that so original and stimulating a book has appeared; that it is a credit to American science, and that it is unique in its nature, no such work, so far as we know, being in existence in England, France or Germany.

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[1] *Butterflies: their Structure, Changes and Life-histories, with special reference to American forms.* Being an application of the "doctrine of descent" to the study of Butterflies, with an appendix of practical instructions. By SAMUEL H. SCUDDER. New York, Henry Holt & Co., 1881. 12mo, pp. 322, with 201 figures.

The special student of butterflies, and the general student of Lepidoptera, will doubtless find fault with some statements and conclusions in the book. The author divides the butterflies into four "families," which we should regard as sub-families; he splits up genera to what seems to us to be a most extreme degree, and quite unnecessary in a book designed for popular use, where only the leading groups need to be emphasized, and the subordinate groups may be suppressed; why should the old name *Papilio* be given to what every one knows by the name of *Vanessa antiopa*, and the genus *Papilio* cut up into a genus for nearly each species; the rule of priority is an excellent one, but in rare cases, and especially such as this, need not be relentlessly followed. The old genus *Hesperia* has been also remorselessly subdivided. If this was done in the lower families of moths, as it could be on the same grounds, it would result in a burdensome and useless list of generic names. Is it not better to indicate such subdivisions rather by numbers than names; and cannot the systematist leave a little margin for the movements of nature in what at best is a direful straight jacket? We deplore the present extreme tendency to analytical views in classification; and believe that the results of catholic, extended study over different orders and classes of animals, and especially of variations in species and genera, induces more conservative and synthetical methods.

Among minor points which we should indicate, is the account of the development of the embryo on p. 11, which does not seem to us to be either clear or exact; on p. 14 in his account of the mouth-parts of the caterpillar, the author needlessly bewilders the student by speaking of the "astonishing number of moveable organs," when there are primarily but three pairs of such organs; it seems to us that this portion is less clear and simple than the succeeding chapters. It has been pretty well shown by embryologists that there are four segments in the head of winged insects corresponding to the four pairs of jointed appendages, viz., the antennæ, mandibles, and first and second maxillæ. Where are we to look for more? This is the view which has been presented in this country, and which is based on the study of hexapodous insects of different orders; and it seems to us the figures of early embryos by Kowalevsky supports the view that there are four rather than five primary segments in the head; the eyes being developed upon the antennal segment, and the labrum and clypeus forming simply the front or facial wall of the œsophagus.

The work is claimed by the author to be an application of the "doctrine of descent" to the study of butterflies, and so it is when he considers the transformations and physical structure of these beautiful creatures, but why does he rather illogically, on p. 101, oppose the only apparent natural explanation of instinct, as the result of inherited habits? How can we conceive of the gradual development and evolution of the hundreds of species and genera from some primitive prototype, and not suppose that the butterfly mind of to-day differs in some respects from the mental traits of primeval butterflies, which had a different environment, different food plants and different enemies, and which must have practiced different arts and stratagems in their struggles for life from those of their descendants?

NEWTON AND JENNEY'S GEOLOGY OF THE BLACK HILLS OF DAKOTA.[1]—This posthumous volume is a worthy monument to the memory of Mr. Newton, a young and promising geologist, who died before completing the main portion of the report, including the first three chapters. Chapter IV on the mineral resources, and V on the climate and resources, are by Mr. Jenney; these were, by resolution of the U. S. Senate, called for in advance of the final report, and with a preliminary map were published in the spring of 1876; the field work occupying the four summer and early autumn months of 1875. It will be remembered that Gen. Custer's famous reconnoisance was made in the summer of 1874.

The Black Hills were first geologically explored by Dr. F. V. Hayden, who made a rapid examination of the geology of the foothills and extremities of the region during the exploration of Lieut. (now Gen.) G. K. Warren, in 1857. Dr. Hayden remarked as the result of his observations, that the Black Hills of Dakota would form one of the most interesting studies on this continent, and that in all the western country he had never seen the Cretaceous, Jurassic, Triassic or red-bed, the Carboniferous and Potsdam rocks so well exposed for study as around the Black Hills, and he spoke of the desirability of a careful detailed topographical and geological survey of this range. The gold discovered under Custer, led the Government to order a geological survey of this region, and the results are placed before the people in this elaborate and valuable report.

Mr. Newton thus speaks of this isolated group of mountains: "Elevated as they are like an island above the surrounding sea of the plains, and separated by more than one hundred miles from the nearest spur or sub-range of the Rocky mountains, the Black Hills are a complete study in themselves. Exhibiting in the strata exposed, and in the general character of the elevation, most of the principal features of the geology of the Rocky mountains, they are a geological epitome of the neighboring portions of that great range. The geologist, therefore, finds in this region a monographic study of universal interest, and by the regularity of the uplift, by the absence of great faults in the strata, and by the splendid exposures of the sedimentary rocks, he is given a piece of mountain geology of great beauty, simplicity and ease of elucidation.

"Usually in explorations in the West or elsewhere, the field of

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[1] *Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region.* J. W. POWELL in charge. Report on the Geology and Resources of the Black Hills of Dakota, with atlas. By HENRY NEWTON, E.M., and WALTER P. JENNEY, E.M. Washington, 1880. 4to, pp. 566.